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Noise to Harmony: The Power of Urban Soundscapes

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APPROVAL CERTIFICATE

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The following study is hereby approved as a creditable work on the approved subject, carried out and presented sufficiently satisfactorily to warrant its acceptance as a prerequisite for the Bachelor of Architecture program.

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CHAPTER 1: INTRODUCTION

1.1 ABSTRACT

In today's increasingly complex urban environments, sound is an omnipresent yet often overlooked force that quietly shapes how we experience the spaces around us. While architecture and city planning have long focused on visual aesthetics and spatial organisation—on what we see and how we move through space—how we hear and emotionally respond to our surroundings has received comparatively little attention. Sound, however, plays a crucial role in influencing mood, behaviour, and the overall atmosphere of a place.

As cities grow denser and more mechanised, the rise in environmental noise has become more than just an inconvenience—it has emerged as a growing concern that affects our cognitive clarity, emotional balance, and overall quality of life. Noise pollution contributes to increased stress levels, disrupted sleep, and reduced productivity, particularly in urban areas where sensory overload is common. However, within this constant hum of modern life lies a unique opportunity: the potential to transform what is often perceived as intrusive or chaotic "noise" into thoughtfully curated soundscapes that add richness, depth, and comfort to our built environments.

A soundscape—a concept introduced by composer and acoustic ecologist R. Murray Schafer—refers to the entire sonic environment as individuals perceive it. This encompasses all the sounds in a particular context, from the subtle rustle of leaves and birdsong to the echo of footsteps, murmurs of conversation, or the distant drone of traffic. Unlike isolated noise control, the concept of a soundscape invites us to think holistically about how sound functions within a space and how it contributes to our overall sensory experience.

This dissertation explores how soundscaping can evolve into a powerful architectural and urban design tool for mitigating unwanted noise and crafting intentional, immersive auditory experiences that resonate with users' emotional and psychological needs. Through an interdisciplinary lens that bridges architecture, environmental psychology, urban design, and acoustic ecology, this research investigates how naturally occurring or technologically composed sound can be deliberately integrated into the built environment to create healthier, more inclusive, and emotionally supportive spaces. Ultimately, this study proposes that by tuning into the sonic dimensions of our cities, we can foster a deeper connection to place and redefine the way we design for the human experience.

1.2 SIGNIFICANCE OF THIS RESEARCH

This research draws attention to the often-overlooked role of sound in shaping human experience within built environments. While urban noise can cause stress and discomfort, consciously designed soundscapes can enhance well-being, social connection, and spatial identity. By exploring soundscaping as a design strategy, the study shifts the focus from noise reduction to creating meaningful auditory experiences that support emotional and sensory comfort in cities.

1.3 RESEARCH QUESTIONS

Architectural design often overlooks the auditory dimension, leading to spaces that may be visually engaging but acoustically unbalanced. While global practices demonstrate how soundscaping can enhance perception, comfort, and well-being, such approaches are rarely applied in India. This study addresses the lack of contextual sound integration in urban design by exploring how sound influences user experience and how natural and designed sounds can be strategically incorporated, especially in culturally and ecologically significant sites like Sunder Nursery.

1.4 AIM

The research aims to analyse the potential of soundscaping as an integral component of architectural and urban design, exploring its applications in creating functional, healthy, and aesthetically pleasing environments that enhance human well-being.

1.5 OBJECTIVE

This study examines how sound influences human perception and behaviour in public spaces, focusing on integrating auditory awareness into architectural design.
By analysing the existing soundscape of Sunder Nursery, the research explores the role of natural sounds in enhancing user experience. It proposes context-sensitive strategies for soundscape integration in similar urban environments.

1.6 NEED FOR STUDY

This study is needed due to rising urban noise pollution and its impact on human well-being, cognitive clarity, and emotional health. As cities become denser and more mechanised, the auditory dimension of design is often overlooked. This research addresses that gap by exploring how soundscaping can improve auditory comfort and enrich the urban experience.

1.7 METHODOLOGY

1. ***Literature Review***

   The theoretical foundation will be established by a critical review of academic literature on soundscaping, acoustic design, environmental psychology, and urban planning.

2. ***Secondary Case Studies***

   A review of relevant secondary case studies will be conducted to explore successful soundscape interventions in similar urban public spaces. These case studies will provide insights into global soundscaping strategies.

3. ***Research***

   This research uses a mixed-methods approach to create a primary study:

a) Field Study and Sound Mapping
   Sound recordings and measurements will be taken at different times and locations within the Sunder Nursery to identify key sounds and noise sources.
b) User Experience Surveys and Interviews
   Visitors will be surveyed and interviewed to understand how sound affects their perception and behaviour in the space.
c) Proposed Strategies for Soundscape Integration
   Based on the findings, strategies will be proposed to enhance the soundscape, tailored to the cultural and environmental context of Sunder Nursery.

1.8 SCOPE OF STUDY

The study focuses on urban settings, emphasising integrating natural and artificial sounds into architectural and urban design. The research will investigate key soundscaping principles, the role of biophilic sound, and how emerging technologies like AI-driven simulations can enhance soundscape design. Drawing on interdisciplinary insights from architecture, environmental psychology, urban planning, and acoustic engineering, this study offers practical strategies for creating healthier, more inclusive, and sustainable urban spaces.

1.9 LIMITATIONS

1. It takes a design and experiential approach, without going into technical acoustic engineering.
2. The research is limited to accessible technologies and does not cover advanced or proprietary acoustic tools.
3. Surveys and interviews are conducted on a modest scale, which may not reflect all user experiences.
4. The study focuses on urban settings, so rural and suburban soundscapes are not in-depth explored.

CHAPTER 2: LITERATURE REVIEW

2.1 PURPOSE

The literature review aims to develop a comprehensive understanding of existing research on soundscaping, architectural acoustics, and their psychological and spatial implications. Specifically, it helps to:

- Identify key theoretical frameworks and foundational concepts, including soundscape theory and principles from environmental psychology.
- Explore interdisciplinary perspectives on the relationship between sound, human perception, and the built environment.
- Inform the research methodology by drawing insights from previous studies, case analyses, and applied practices.

2.2 CATEGORISATION

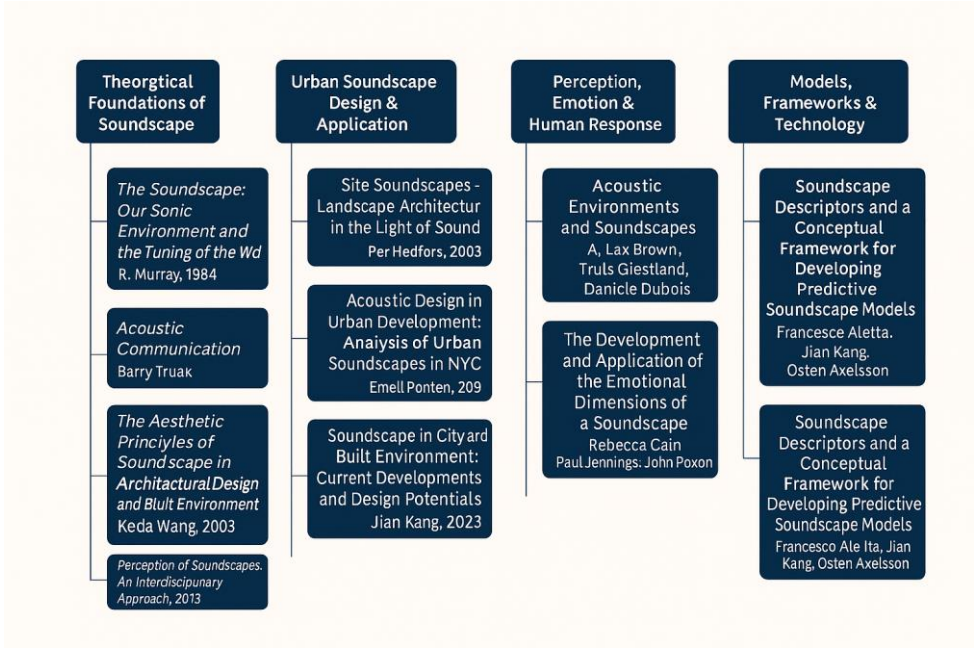


Figure 2: Categorisation of Literature (Source: Author)

Table 2.1 (Source: Author)

LIST OF LITERATURE STUDIED		
Literature	**Author**	**Year**
The Aesthetic Principles of Soundscape in Architectural Design and Built Environment	Keda Wang	2003
Site Soundscapes – Landscape Architecture in the Light of Sound	Per Hedfors	2003
Soundscape Descriptors and a Conceptual Framework for Developing Predictive Soundscape Models	Francesco Aletta, Jian Kang, Östen Axelsson	2016
Perception of Soundscapes: An Interdisciplinary Approach	William J. Davies, Mags D. Adams, Neil S. Bruce, Rebecca Cain, Angus Carlyle, Peter Cusack, Deborah A. Hall, Ken I. Hume, Amy Irwin, Paul Jennings, Melissa Marselle, Christopher J. Plack, John Poxon	2013
Acoustic Environments and Soundscapes	A. Lex Brown, Truls Gjestland, and Danièle Dubois	2015
Acoustic Design in Urban Development: Analysis of Urban Soundscapes and Acoustic Ecology Research in New York City	Emeli Pontén	2009
Wanted Unwanted Sounds: Perception of Sounds from Water Structures in Urban Soundscapes	Maria Rådsten-Ekman	2015
The Soundscape: Our Sonic Environment and the Tuning of the World	R. Murray Schafer	1994
Soundscape in City and Built Environment: Current Developments and Design Potentials	Jian Kang	2023
Acoustic Communication	Barry Truax	1984
The Development and Application of the Emotional Dimensions of a Soundscape	Rebecca Cain, Paul Jennings, John Poxon	2013

Table 2.2 (Source Author)

Comparative Analysis Literature Reviews				
Study	Focus Area	Key Findings	Methodology	Applications
Wang (2003)	Integration of soundscape aesthetics in architecture	Developed a framework for incorporating acoustic elements into architectural aesthetics, emphasizing multi-sensory design.	Literature review, case studies, graphic visualization of soundscape elements.	Architectural design, urban aesthetics.
Hedfors (2003)	Landscape architecture and soundscape planning	Proposed the concept of 'sonotope' and emphasized the role of sound in shaping landscape character.	Case studies, qualitative interviews, development of a planning tool.	Landscape architecture, urban planning.
Aletta, Kang & Axelsson (2016)	Development of predictive models for soundscape assessment	Identified key soundscape descriptors such as Pleasantness–Eventfulness and Calmness–Vibrancy.	Literature review, statistical analysis of soundscape descriptors.	Urban soundscape design, policy development.
Davies et al. (2013)	Human perception of soundscapes	Identified cognitive and emotional factors influencing soundscape perception.	Soundwalks, listening tests, focus groups, physiological	Urban planning, public health.
Brown, Gjestland & Dubois (2015)	Acoustic ecology and noise management	Differentiated between environmental noise control and soundscape enhancement approaches.	Literature review, comparative analysis of noise management vs. soundscape design.	Noise regulation, urban soundscape
Pontén (2009)	Urban soundscape and acoustic ecology	Highlighted the lack of awareness among urban planners regarding acoustic aesthetics.	Interviews with urban acoustics practitioners, case studies.	Urban development, noise abatement strategies.
Rådsten-Ekman (2015)	Role of water-generated sounds in urban environments	Found that water sounds can improve perceived soundscape quality but must be carefully selected.	Psychoacoustic experiments, sound evaluations, field recordings.	Urban park and plaza design.
Schafer (1994)	Conceptual foundation of soundscape	Introduced key concepts like keynote sounds, soundmarks, and signals.	Historical analysis, field recordings, theoretical development.	Basis for modern soundscape
Kang (2023)	Holistic soundscape planning in urban environments	Advocated treating sound as a resource rather than a byproduct.	Review of recent research, development of a soundscape design framework.	Smart cities, adaptive urban sound design.
Truax (1984)	Relationship between sound, communication, and technology	Introduced the concept of 'schizophonia' (separation of sound from source).	Theoretical analysis, discussion of electroacoustic communication.	Media studies, soundscape design in digital spaces.
Cain, Jennings & Poxon (2013)	Emotional impact of urban soundscapes	Identified two emotional dimensions of soundscapes: *Calmness* and *Vibrancy*.	Principal Component Analysis (PCA), soundwalks, listening tests.	Urban planning, soundscape evaluation, target-setting for urban sound

CHAPTER 3: UNDERSTANDING SOUNDSCAPING

3.1 WHAT IS SOUNDSCAPING?

Soundscaping is the intentional design and orchestration of the acoustic environment to shape human experiences, behaviour, and emotions within a space. Unlike traditional approaches to sound management, primarily focused on suppressing noise, soundscaping embraces the entire spectrum of auditory stimuli. It recognises that sound is not merely a by-product of the built environment but a vital component that influences our sense of comfort, safety, place attachment, and psychological well-being.

The goal of soundscaping is not to achieve silence, but to create a balanced auditory environment that supports the intended function of a space. For example, in a hospital setting, soundscaping might involve reducing mechanical noise while enhancing calming natural sounds. It might mean masking traffic with water features or integrating sound art to invite social interaction in a public plaza. This approach considers the qualitative aspects of sound—how it is perceived, understood, and felt by individuals, making it a human-centred acoustic strategy.

3.2 IT'S EVOLUTION

The Industrial Revolution is the key event that drastically changed the soundscape forever. Then, the electric revolution came, and sound sources have multiplied and amplified. The pre-industrial city was characterised by the centripetal sound of the bell, the chime of the mechanical clock, the strident whistle of the mill's wheel, and the tang-tang-ting-tang-tang made by the blacksmith.

The main European keynotes were related to stone and the tools used to model it; moreover, the creaking of wagon wheels and whips, the clutter of horses' hooves on cobblestone streets, and the shouting voices of vendors could also be heard.
Together with the Industrial Revolution, since 1790, a lo-fi soundscape has developed. It is characterised by an overabundance of sounds that prevents us from hearing every sound event that constitutes the given soundscape. The Industrial Revolution spread to

most sectors, particularly when new materials, energy sources, and machines emerged. Among the most important innovations: the sewing machine, the typewriter, the train rails, the drilling rig, the motorcycle, the steam engine, the steamboat, the internal combustion engine, the telegraph, the hydraulic press, the train and many other discoveries that have drastically changed the entire society. All these sounds related to the new technologies were soon considered inevitable. The population had already accepted these sounds, showing no sign of resistance at all. It let them tune with – and sometimes even substitute – the natural rhythms and the sounds of nature that once dominated the world. Men increasingly started looking for noise, as if they could show their power with it. The louder a sound is, the more attractive it gets for crowds, no matter if it is the sound of a pneumatic drill or if it is produced by a cannon. In this way, having the chance to use a space equals the possibility to make sounds, showing one's power.

After the Industrial Revolution, the Electric Revolution began, and a further expansion of energy sources took place, thanks to the discovery of packaging and storing techniques for sound and the splitting of sounds from their original contexts. The main innovations of these years were: the phone, the phonograph and the radio. Thanks to these modern devices, a new phenomenon, called by Schafer schizophonia (from Greek schizo, that means split and phonè, that is voice), started. It is defined as the splitting of an original sound and its electroacoustic transmission or reproduction *(Schafer, 1977, p. 88).* Since those years, any sound could be recorded and reproduced in another context, which can be drastically different from the one where it was created.

No sound is original anymore, every sound is now independent and amplified, in time and space. Through the passing of different times, which led to new inventions, the morphology of the soundscape has changed. Passing "from wood to plastic", "from feet to air tires", "from horn to telegraph", "from ratchet to siren".*(Schafer, 1977, p. 161).* Sometimes, the changes have been spread through time, whereas there was an abrupt transformation at other times. Even though it is nearly impossible to determine any future modifications related to sound, soundscapes will certainly continue evolving, along with men and technologies.

The concept of the soundscape was pioneered in the 1970s by Canadian composer and acoustic ecologist **R. Murray Schafer**, who introduced the term as part of his groundbreaking work in **acoustic ecology**. Schafer viewed the world's sonic environment not merely as background noise but as an essential part of our lived experience—something to be studied, interpreted, and, where necessary, "tuned" to better serve human and ecological well-being. In his influential book *The Soundscape: Our Sonic Environment and the Tuning of the World* (1977), he proposed that every place has a unique "sonic identity" shaped by both natural and human-made sounds. He emphasised the need to listen more attentively to the world around us, warning that modern urbanisation and industrialisation were leading to a phenomenon he called **"schizophonia"** —a disconnection between sound and its source.

Schafer's work laid the theoretical and philosophical foundation for what would later evolve into a cross-disciplinary field involving architecture, urbanism, public health, and environmental psychology. Initially rooted in environmental awareness and cultural critique, the concept of the soundscape has since moved beyond academic discourse into practical applications. Architects and urban designers have adopted soundscape principles to shape spaces that are not only visually appealing but also acoustically meaningful.

Today, Schafer's once-niche idea has matured into a design methodology and planning tool applied to everything from quiet urban zones and public installations to sound-enhanced therapeutic spaces. It now forms an essential part of human-centred and multisensory design, particularly as cities confront rising noise pollution and seek more sustainable, inclusive, and psychologically attuned environments.

3.3 COMPONENTS

Schafer categorised the components of a soundscape into three main elements:

- **Keynote Sounds**: The ambient background sounds that define a space and often go unnoticed, such as wind, distant traffic, or the hum of urban life.
- **Sound Signals**: Foreground sounds meant to be consciously heard and interpreted, such as a bell tower, pedestrian crossing alert, or train whistle.
- **Soundmarks**: Sonic landmarks unique to a location and hold cultural or emotional significance, such as ocean waves in a coastal city or the call to prayer in certain regions.

Schafer added archetypal sounds to these three main categories, which he defined as ancient sounds inherited from remote antiquity and endowed with symbolism and mystery.

This framework helps designers analyse and intentionally shape a space's acoustic profile to reflect its function and emotional tone.

3.4 NOISE AND SOUND POLLUTION

Nowadays, society is characterised by countless sound sources: from the means of transportation, to the silent rustling of the city, from the sound of traffic during the rush hour, made of people honking and engines roaring, to the different languages that can be distinguished while walking in the streets. Every day, it gets more and more challenging to find quiet spaces. Generally speaking, the sound intensity decreases as we get further from the city centre and enter the outskirts, exchanging the chaos with the calm of the isolated villages.

All these sounds that are layered with one another make it difficult to understand the space around us, and they have also made us forget how to listen to and look for silence. Schafer points out that the modern soundscape has incited the desire for noise. The higher the sound intensity in the streets and the workplace, the louder the music of working tasks carried out by modern citizens, regardless of the damage this can cause to their health. Sometimes, the lowering of sound intensity is seen as a loss of vitality; consequently, not many people accept the lowering of that intensity. The noise turned into music, and it became a symbol of a victorious conquest *(Turri, 2004, p. 29)*.

The necessity to "turn the volume up" is thought to have been spread after the Industrial Revolution, when society modernised and the first electronic devices were born, such as the radio, the television, the drill, and the air-conditioning. During this time, the first means of transportation were developed: the automobile, the trail, and the aircraft. These new technologies have inevitably led to sounds never heard before. The latter sounds are layered with one another, creating interference and often harming human health. Soundscape is now saturated and polluted, especially in cities, where we should talk about noisescape instead.

According to Barry Truax, noise can be described in four different ways: firstly, noise is an undesired sound; secondly, it is a non-musical sound; thirdly, it defines any high pitch sound; and lastly, noise designates any sound that disturbs the communication system *(Truax, 1999)*. However, one of the first and most satisfactory definitions is the one that identifies noise as an "undesired sound". Consequently, noise is strictly related to a single individual's subjective and personal idea: what one may define as music might appear to be just noise to other people. The individual's perception is responsible for separating sounds from noise, basing its decision on psychological, social and cultural elements. Besides, extended exposure to high-intensity sound sources can seriously damage your hearing and the environment. For this reason, many studies have been conducted on noise propagation and the decrease of noise in urban areas.

Noise is a part of our lives and cannot be removed easily. However, we should reduce our noise exposure and engage in practices to minimise sound pollution, both locally and globally.

For example, how does it work in Italy? Italy uses the Local Plan of Sound Classification – PCCA (Piano Comunale di Classificazione Acustica) to regulate soundscapes. The plan divides the local territory into different classes, associated with defined noise ranges. Considering the functions of these spaces, we can distinguish different areas: industrial, mixed, residential, and particularly protected areas. This classification avoids any qualitative consideration of the sound phenomenon, and it tends to oversimplify the soundscape, because it does not consider the use of the spaces and brings everything on the same level of meaning. Understanding which sound is considered noise, at what moment of the day and in what place, is a challenging task. The local authorities should

find different solutions to limit the noise, but they do not have to forget their context mandatorily.

"It is not a matter of choosing either a noise control or a soundscape approach, but instead choosing noise control supplemented by soundscape planning. A potential outcome of adopting soundscape approaches may be that it will assist in capturing the imagination of politicians, policy makers, and a range of design professionals concerning the management of the outdoor acoustic environment in a way that the current sole focus on environmental noise control tends not to." *(Brown, 2012, p. 79)*

3.5 THE DEFENCE OF SOUNDS AND SOUNDSCAPES

Some sounds are considered unique, and therefore, they should be valued and preserved. Moreover, this sound can contribute to the definition of the place identity. This principle follows the objectives expressed in the "Convention for the Safeguarding of the Intangible Cultural Heritage" *(UNESCO, 2003, art. 2)*, approved in 2003 by UNESCO. This Convention is significant in the context of soundscapes and urban design as it includes a series of elements in the intangible cultural heritage, such as language, performing arts, social practices, ritual and festive events. These elements are manifested in the soundscape in which a community identifies itself. However, when talking about soundscapes, we should not focus only on safeguarding as a device of defence and protection of single elements; we should also consider an enhancement towards the attractiveness and sensitivity of a community, including soundscapes in their totality.

Since 1994, Japan's Environmental Protection Agency (EPA) has carried out the project 100 Soundscapes of Japan: Preserving our Heritage, to limit sound pollution, protect the environment and increase the consciousness of the country's natural heritage. Citizens and local communities have been encouraged to submit sounds that deserve to be protected for their particular sound qualities. In total, 738 nominations have been submitted, and 100 have been selected to be identified as symbols of the richness and variety of the nature and culture of the country. Regarding Japan's environmental policy measures, the project was meant to focus on the local aspects of the territory. We aim to promote the discovery of sound features of everyday life and support the conservation of the natural environment and cultural heritage, entrusting them to future generations.

Following Japan's idea, between 2003 and 2004, the Finnish Society for Acoustic Ecology promoted the project One Hundred Finnish Soundscapes. The main goal was to record, protect and search for the existing soundscapes, and spread their awareness among the local populations. After the one hundred most representative soundscapes were selected, they were recorded, divided into six categories, and archived.

3.6 SOUNDSCAPE: CLASSIFICATION & PERCEPTION

R. Murray Schafer identified different criteria for improving perception, capacity, and creativity in classifying soundscapes.

He distinguished four different ways to describe a sound, according to:

- Its physical features (acoustics)
- The way it is perceived (psychoacoustics)
- Its function
- Its meaning (semantics)
- Its sentimental and emotional features (aesthetic)

However, as his fellow composer Barry Truax stated, it is impossible to understand a soundscape only by listing its features. It would be better comprehended through mental representation, which helps with memory and comparison.

Sound study is traditionally divided firstly into acoustics and psychoacoustics, then semantics and aesthetics (Figure 3.1). Although sound analysis can be carried out in these four disciplines, it is essential to note that sounds often have features not in these fields of study. For instance, the singing birds and the water flowing are usually perceived as positive sounds, while the traffic is generally negative. Consequently, the sound of water should be relaxing in every situation, but it is not. This highlights the limitations of current sound analysis methods and the need for further research in this area.

Acoustics	*Physicist*
What sounds are	*Engineer*
Psychoacoustics	*Physiologist*
How they are perceived	*Psychologist*
Semantics	*Linguist*
What they mean	*Communicator*
Aesthetic	*Poet*
If they appeal	*Composer*

Figure 3.1: The study of sounds. (Schafer, 1985)

On the contrary, the same sound may appear annoying and frustrating when it covers other sounds the listener wants more attention to. For this reason, a sound's classification should give prominence to the context where it is found. A sound does not only have one specific effect, and two sounds with the same features may have different effects and meanings: the context clarifies the use.

It has been largely proved that opinions on sound and noise are necessarily related to quality and culture. In particular, sound is closely related to the activities performed in the

given environment and its semantic features. Only after considering these elements is it possible to evaluate its quantitative parameters.

A soundscape can be regarded as either pleasant or unpleasant, depending on its perceptive elements, which go beyond the physical features of the sound. Firstly, the attention must be focused on the listener, who recognises the sound and evaluates the landscape according to their taste. The role of the listener for assessing a soundscape is crucial, as their perception and interpretation of the sound can significantly influence the overall experience of the urban environment. It is essential to consider the activity the listener is performing, which conditions their attention level towards the sound. Moreover, we should consider their location's time and physical and cultural context (Figure 3.2).

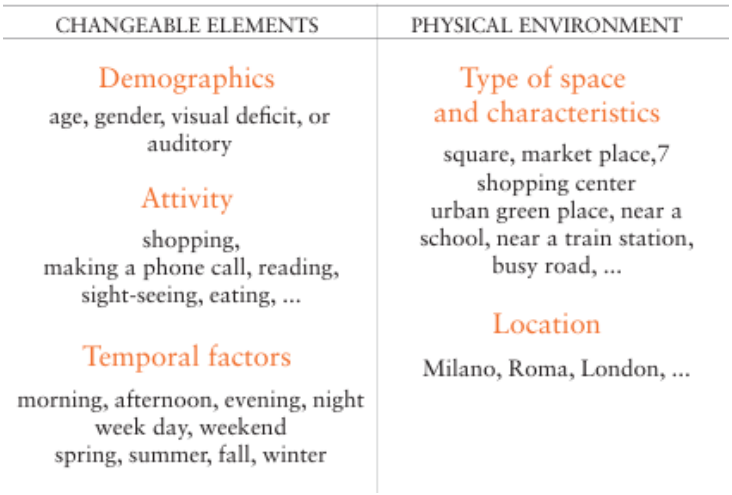


Figure 3.2: Relevant factors in the sound perception by users. (Cain, 2008)

The perception of a soundscape also depends on the possibility of recognising the sound source. Let us compare a natural sound that is recognisable with a modified sound with the same intensity but unrecognisable. Our opinion on the sound quality is likely positive in the first case and negative in the second, as if we could control the recognisable sound more easily than the other.

Other essential criteria for a sound's perception are calmness and vitality, associating the sound with our everyday lives, and other aspects well-known and shared by the community.

Moreover, the physical features of the landscape should be considered, such as reverberation, which increases the perception of noise.

Lastly, the evaluation of a soundscape is closely related to sight, both in natural and anthropic environments. When one sees a natural landscape but cannot hear its sounds, one is destabilised; consequently, the listener will perceive the surrounding landscape as unpleasant. In addition, sometimes the pleasantness of our sight does not correspond to the pleasantness of our ears. We can find ourselves in front of a beautiful panorama, but

we cannot perceive it as such because strong noises are coming from different parts. This can happen in an urban park rich in different vegetation species and beautiful colours, but at the same time, traffic noise in the background does not allow the user to enjoy the landscape fully. Moreover, vice versa, we can be in a degraded area, with a low quality, but the surrounding nature can produce positive sounds that give us a sense of peace.

In Western society, silence is often perceived as something negative, as if it were a space that must be filled. This habit made us forget how necessary it is to rediscover silence and recognise it as a positive aspect of life. Silence must be perceived as a sign of the minor presence of men in the landscape; in this way, the artificial leaves space to nature, and its typical sounds and noises. Remaining silent does not equal the cancellation of humans' relationship with the world; it simply means living this relationship differently *(Turri, 2004, p. 36).*

3.7 IMPORTANCE IN CONTEMPORARY URBAN DESIGN

As urban environments become increasingly dense, mechanised, and saturated with various noise sources—from traffic and construction to industrial activity and human movement—the role of soundscaping in shaping healthier, more livable cities becomes relevant and essential. Urban sound is no longer just a by-product of development; it is a significant environmental factor that influences how people feel, function, and interact within their surroundings.

- **Mental Health**: Constant or high-intensity noise can trigger psychological stress, anxiety, irritability, and a general sense of discomfort. The lack of auditory relief can reduce an individual's emotional resilience.
- **Cognitive Performance**: Persistent noise pollution has impaired focus, memory retention, and task performance. Children, older people, and neurodivergent individuals are particularly vulnerable to such acoustic disturbances.
- **Physical Health**: Beyond mental strain, chronic exposure to urban noise has been linked to sleep disturbances, increased blood pressure, cardiovascular stress, and even a higher risk of long-term health complications such as hypertension and stroke.

In light of these findings, soundscaping offers an opportunity to reframe the role of sound, not as an unavoidable nuisance but as a critical component of spatial well-being and design quality.

This shift in approach—from reactive noise control to proactive sound design—allows cities to move toward spaces that heal rather than harm, engage rather than overwhelm, and connect rather than isolate.

CHAPTER 4: WORLDWIDE BEST PRACTICES

The soundscape can be enhanced through different practices, which may be related to other spheres, such as the history of architecture, urban planning and landscape. They can also be projects more related to acoustics, such as museum installations that perfectly show the research work in the field. It is possible to distinguish between the two different types of design. The first one is more oriented to enhance and manage the existing sounds, which must be preserved. Among the most common elements used in soundscape design, we can find the natural sounds of water and wind. The second type of designing is more innovative and consists of creating new sounds within the landscape, exploiting the surrounding environment. This chapter will show examples of national and international projects considered “best practices” in the soundscape. They intend to give new value to the soundscape of a specific environment or territory and enhance its features, using sounds, keynotes, and soundmarks as active resources for the soundscape design.

4.1 THE SOUNDS OF WATER – VILLA D’ESTE

Villa d'Este is one of the best-known and emblematic examples of garden design, carried out through natural elements, particularly exploiting water use. It is included in the UNESCO list and is defined as a World Heritage Site. The garden of the Villa, designed by Pirro Ligorio, is considered one of the greatest masterpieces among Italian gardens. In particular, it is characterised by numerous sources of water, which are canalised from the river Aniene to the whole area. These water fountains create different sound environments that leave their visitors speechless.

Figure 4.1: View of the villa and the fountain in front (Wikipedia)

Figure 4.2: Rometta Fountain (Wikipedia) Figure 4.3: Cento Fontane Avenue (Wikipedia)

4.2 SEA ORGAN

The Sea Organ in Zadar, Croatia, is a successful example of using water as a tool for designing a particular soundscape. This project was created by the architect Nikola Bašić, and it is considered the central core of a redevelopment project that aimed to improve the urban quality of a degraded and now marginal seafront. At first glance, they look like common white steps, but in reality, it is a real marine organ that allows those who walk along the city harbour to listen to the sound of the sea. This architecture has become one of the city's symbols and a meeting point for citizens and tourists. Thirty-five organ pipes - polyethene pipes of different lengths, diameters and inclinations - were installed inside the 70 metres of steps between the shore and the sea. Once activated by the movement of air generated by the waves of the sea, they spread a harmonious and constant sound from the openings in the pavement. The symphony is modulated according to seven chords and five tones, typical of Dalmatian music, and they create a continuously different concert, coordinated by the sea and its natural rhythm.

Figure 4.4: Water is seeping into the structure (Wikipedia)

4.3 FOREST MEGAPHONES

Inside the Võru forest in Estonia, a group of architecture students transformed a clearing into a place for listening and meditation. They were well aware of the beauty of Estonian forests and were fascinated by their natural sounds. The aim of the megaphones, which have a diameter of 3 meters, is to amplify the natural music you can listen to in the forest, without altering the balance of the forest or damaging the landscape in any way. Visitors can lie down inside the megaphones and relax while listening to the sounds of the landscape surrounding them. They can close their eyes and let themselves experience something new: immersed in nature, they can hear the sound of the leaves moved by the wind, the sound of the rain, the chirping of birds and the calls of insects.

Figure 4.5: Megaphones inside the Võru forest (Wikipedia)

Figure 4.6: Visitors can use megaphones in the to listen to nature (Wikipedia)

4.4 MAGGIE'S LEEDS CENTRE

Maggie's Centre in Leeds, designed by Heatherwick Studio, offers a calming, non-clinical space for cancer patients. Set within landscaped gardens, its timber pavilions use natural materials and soft acoustics to create a quiet, supportive environment. The soundscape—rustling leaves, birdsong, and muffled indoor tones—enhances emotional well-being and encourages reflection, showing how thoughtful design can support healing through sound. *(Archdaily)*

Figure 4.7: View of Maggie's Centre (Wikipedia)

CHAPTER 5: PRIMARY STUDY

5.1 LOCATION

The area under analysis is located within Sunder Nursery, a 90-acre heritage park in the heart of New Delhi, adjacent to the Humayun's Tomb World Heritage Site.

Initially established in the early 20th century as a Central Public Works Department nursery, the site has since been revitalised into a vibrant ecological and cultural landscape. Today, Sunder Nursery integrates historical monuments, botanical collections, and a diversity of environmental habitats. Its landscape features native tree species like neem, jamun, and amaltas; seasonal flowering beds and water channels reminiscent of Mughal gardens; remnants of Mughal-era pavilions and tombs; and curated biodiversity zones that reflect both the site's natural heritage and historical significance.

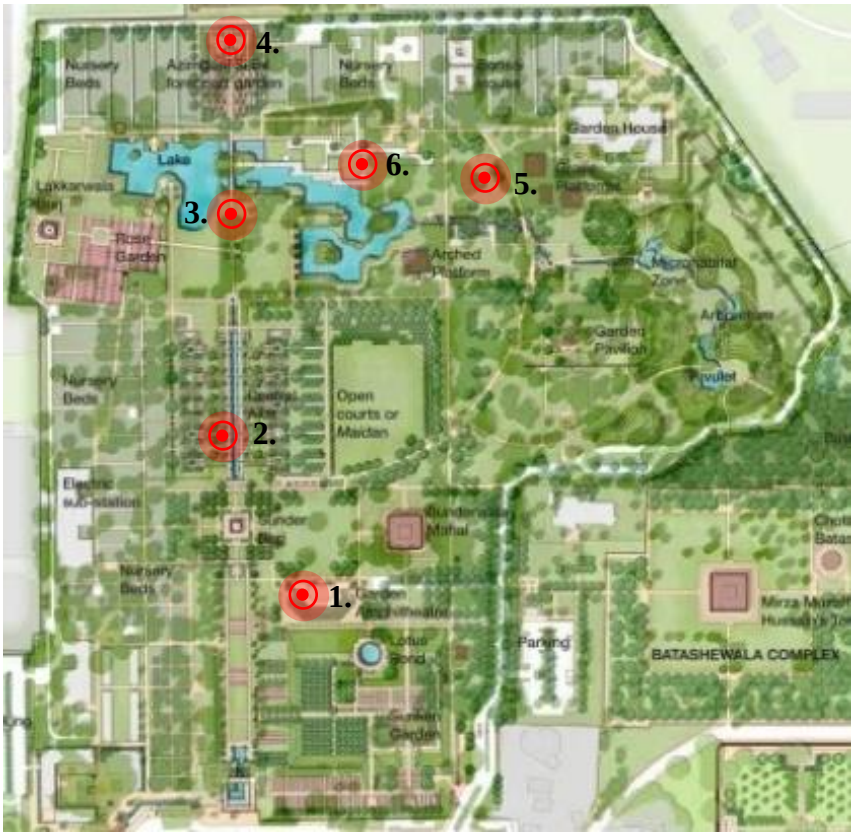
Figure 5.1: Sunder Nursery Landscaping Plan (www.sundernursery.org)

5.2 FIELD JOURNAL

Sunday, 27th April

I arrived at Sunder Nursery around 5 PM. The weather was pleasant with soft sunlight and a light breeze rustling the leaves. The park was lively, with families enjoying picnics, children playing, and groups chatting on benches.

The auditory environment was a mix of laughter, birdsong, and the gentle hum of wind through trees. The nearby water channels added a faint trickling sound, blending with the occasional distant voices of people. Despite the activity, the space felt calm and harmonious, with the natural elements softening the human noise.



Where?	When?	How much?	Who?	How?
6 points	Sunday, 5 p.m.	2 hours recording	Unskilled person	Smartphone

Figure 5.2: Sunder Nursery Research Points (Edited by: Author)

5.3 CLASSIFICATION

5.3.1 TYPOLOGY

- **Geophonies:**
  Natural, non-biological sounds like wind, rain, or water.
- **Biophonies:**
  Sounds made by living organisms, such as birdsong or insect activity.
- **Anthropophonies:**
  Sounds produced by humans, like conversation, traffic, or machinery.

5.3.2 INTENSITY

- **Keynote Sounds:**
  Background sounds that define an environment, like wind or distant traffic.
- **Sound Signals:**
  Sounds that convey information or alert listeners, like alarms or bells.
- **Soundmarks:**
  Unique, iconic sounds are tied to a specific place, like a church bell or ocean waves.

5.3.3 CLASSIFICATION OF SOUNDS HEARD IN POINT #1

1. Geophonies:
   Wind noise and leaves rustling sounds are present, though not dominant.
2. Biophonies:
   Birdsong is present constantly.
3. Anthropophony:
   Human voice (speech) is slightly prominent.
   Faint bike and train sounds can be heard.
4. Keynote:
   The ambient environmental noise and soft wind act as the keynote.
5. Sound Signals:
   None.
6. Soundmark:
   The birdsong could be considered a soft soundmark.

Frequency weighting	A
Response time	Fast (0.2s)
Calibration	+0.0 dB
Avg/Leq	62.3 dB
Min	51.1 dB
Max	83.1 dB
Peak	91.4 dB

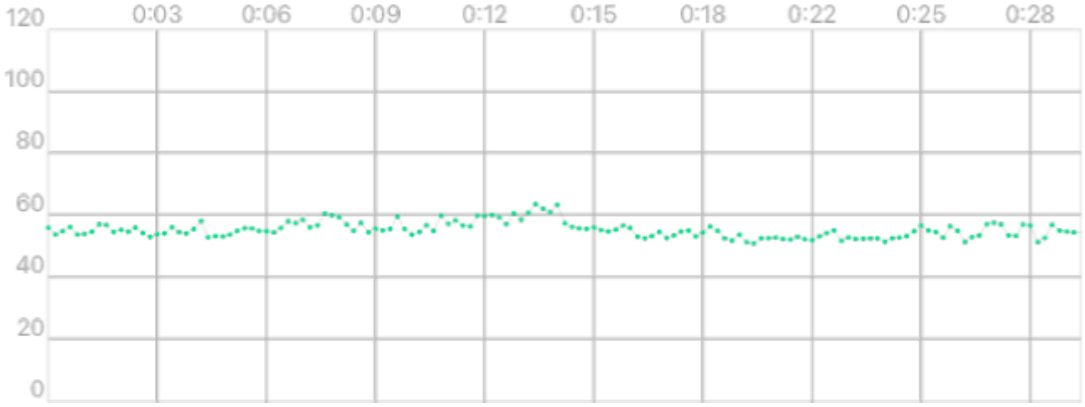


Figure 5.3: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.4: View of Sound Source (Source: Author)

5.3.4 CLASSIFICATION OF SOUNDS HEARD IN POINT #2

1. Geophonies:
   Wind noise and subtle water flowing sounds are present throughout the background, especially in quieter parts. These serve as part of the atmospheric texture.
2. Biophonies:
   Birdsong is present intermittently.
3. Anthropophony:
   Human voice (speech) is the most prominent feature of the soundscape.
   Faint vehicle sounds can also be heard.
4. Keynote:
   The ambient environmental noise and soft wind are the keynote, constant, relatively unobtrusive, and provide a sonic backdrop.

5. Sound Signals:
   The human voice is the sound signal, intended to draw the listener's attention, occupying the foreground of the acoustic field.
6. Soundmark:
   The birdsong could be considered a soft soundmark.

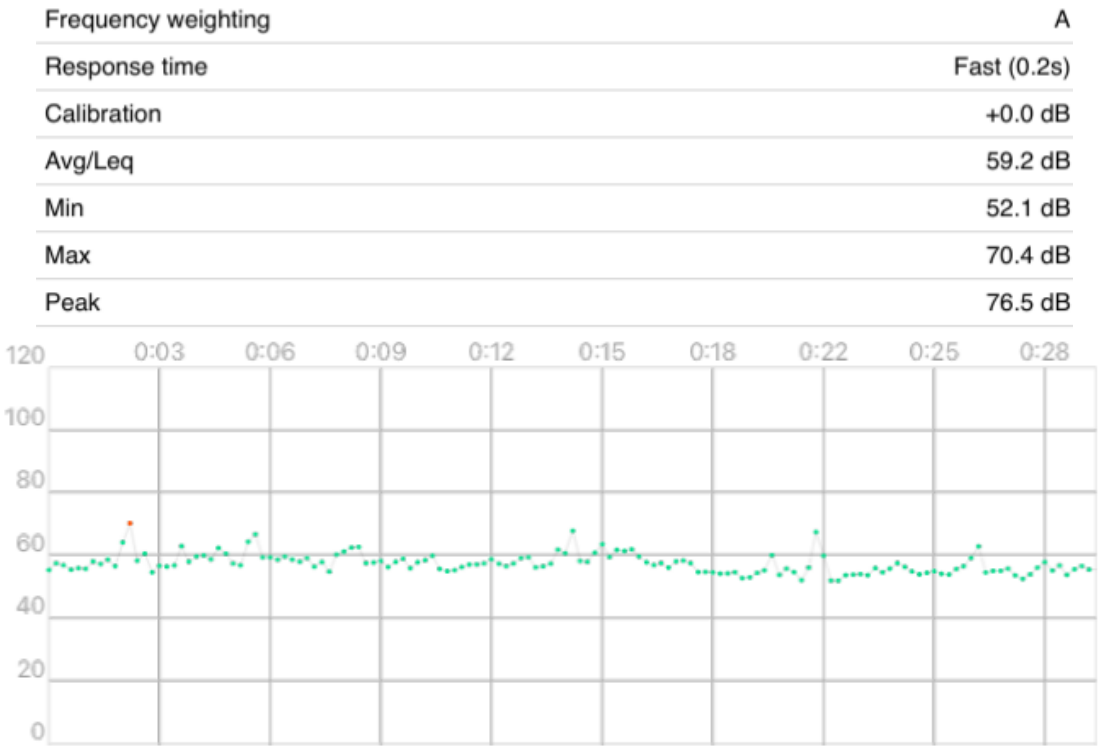


Figure 5.5: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.6: View of Sound Source (Source: Author)

5.3.5 CLASSIFICATION OF SOUNDS HEARD IN POINT #3

1. Geophonies:
   Constant water flowing sounds and faint leaves rustling are present.
2. Biophonies:
   Birdsong is present intermittently in the background.

3. Anthropophony:
   Human voice (speech) is the most prominent feature of the soundscape.
4. Keynote:
   The low-level ambient water sounds function as the keynote.
5. Sound Signals:
   The human voice is the primary sound signal—deliberate, clear, and meant to attract.
6. Soundmark:
   The birdsong could be considered a soft soundmark.

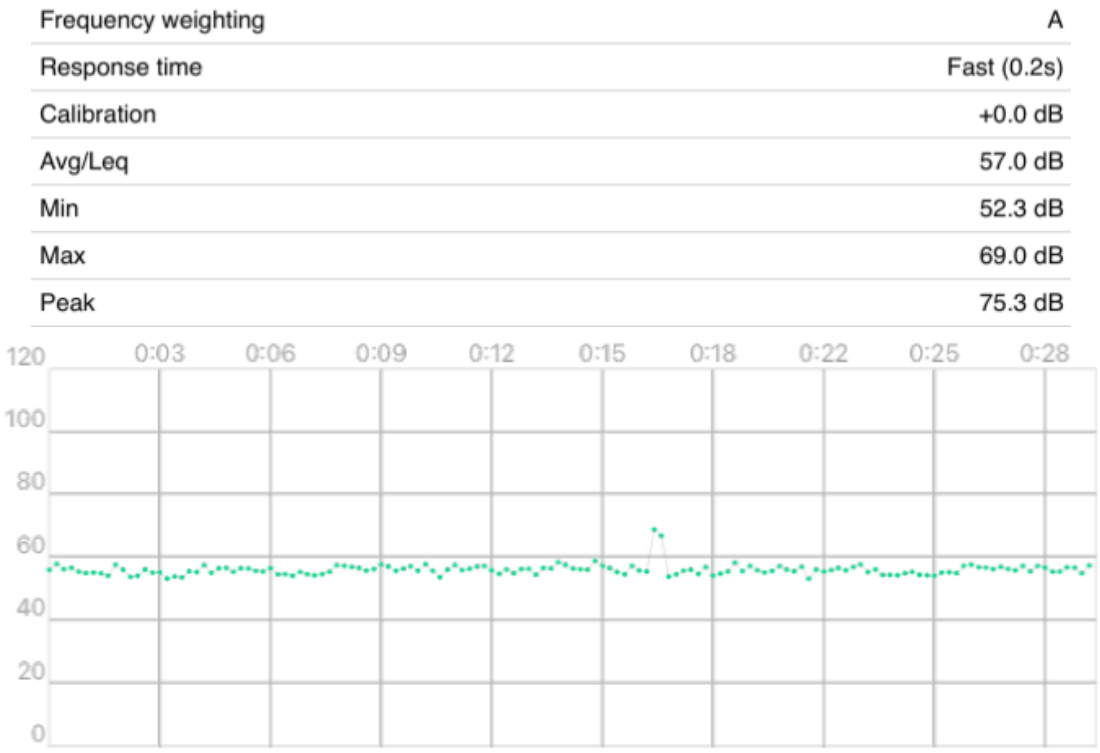


Figure 5.7: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.8: View of Sound Source (Source: Author)

5.3.6 CLASSIFICATION OF SOUNDS HEARD IN POINT #4

1. Geophonies:
   Irregular water flow is the dominant geophonic sound.

2. Biophonies:
   A peacock's call stands out clearly, accompanied by other birds ' songs.
3. Anthropophony:
   Faint human voices and a train sound are present but not overpowering.
4. Keynote:
   The continuous yet irregular water flow serves as the keynote
5. Sound Signals:
   The peacock's call is the primary sound signal.
6. Soundmark:
   The peacock call can be considered a strong soundmark.

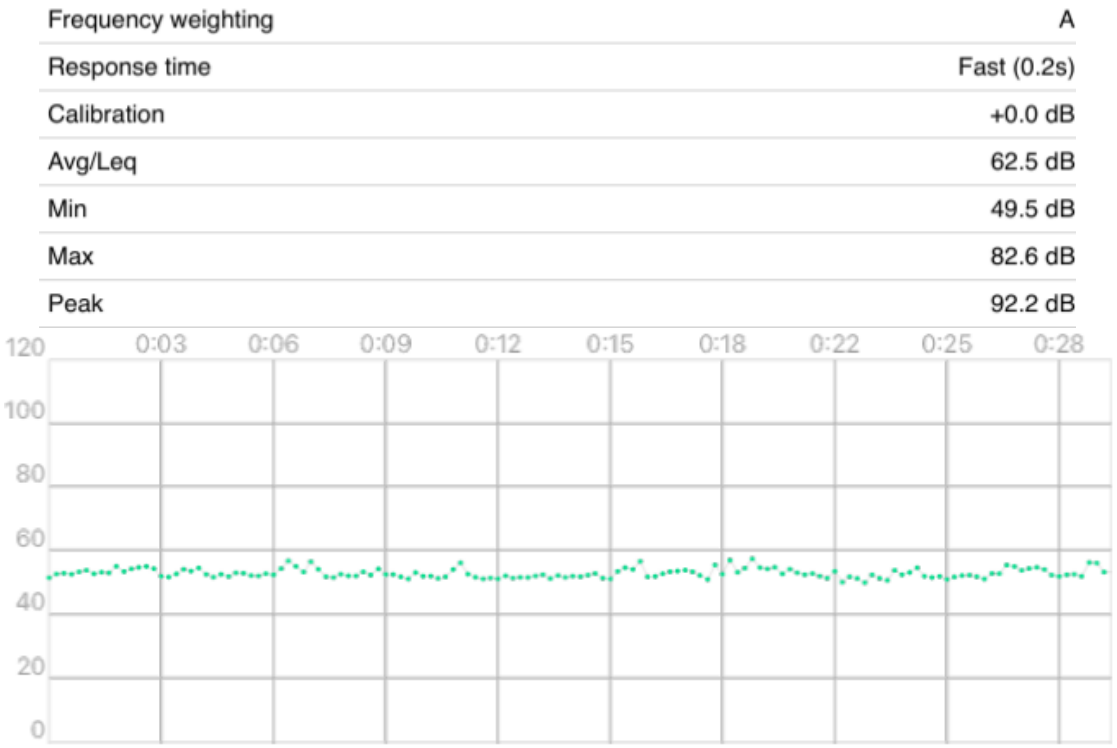


Figure 5.9: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.10: View of Sound Source (Source: Author)

5.3.7 CLASSIFICATION OF SOUNDS HEARD IN POINT #5

1. Geophonies:
   Light wind sounds are faintly present in the background.
2. Biophonies:
   Birdsong is present intermittently in the background.
3. Anthropophony:
   Children and construction noise are the dominant sounds, train sound is also present.
4. Keynote:
   The light wind and distant ambient construction noise serve as the keynote.
5. Sound Signals:
   Children's voices and laughter act as the primary sound signals.
6. Soundmark:
   The creaking swings and children playing could be considered soundmarks.

Figure 5.11: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.12: View of Sound Source (Source: Author)

5.3.8 CLASSIFICATION OF SOUNDS HEARD IN POINT #6

1. Geophonies:
   A very faint water fountain sound is present.
2. Biophonies:
   A faint bird sound is occasionally present.
3. Anthropophony:
   Human voices are dominant, with background music and a steady cooler/fan sound.
4. Keynote:
   The superb sound and background music form the ambient keynote.
5. Sound Signals:
   Human speech is the primary sound signal.
6. Soundmark:
   The South Indian music could be considered a soft cultural soundmark.

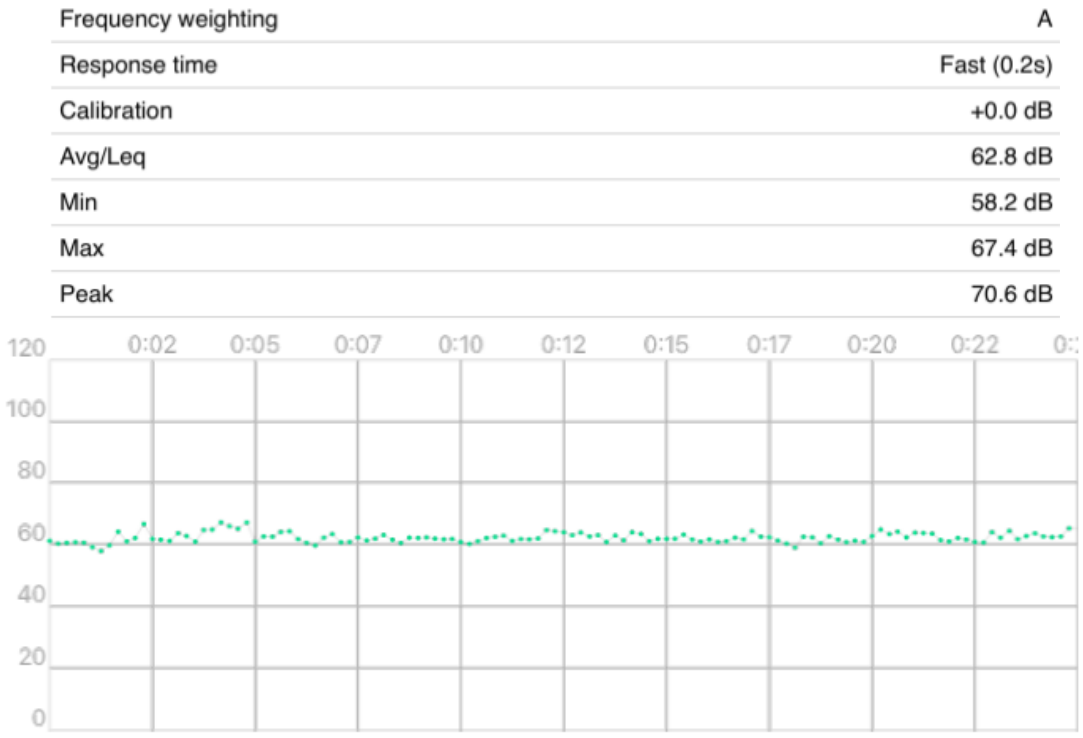
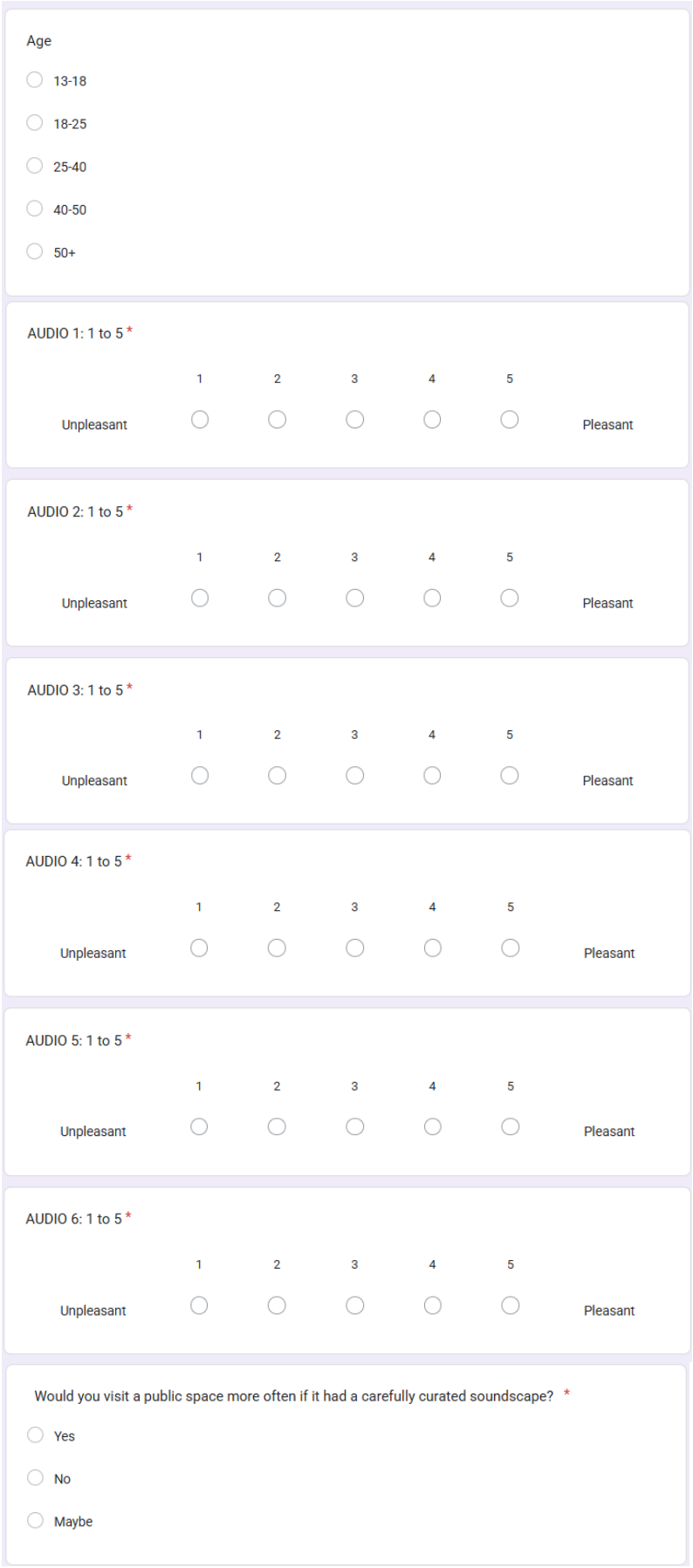


Figure 5.13: Frequency Graph (Source: Author, Aid: Decibel X)

Figure 5.14: View of Sound Source (Source: Author)

5.4 PERCEIVED SOUNDSCAPE QUALITY: AN AUDIO SURVEY



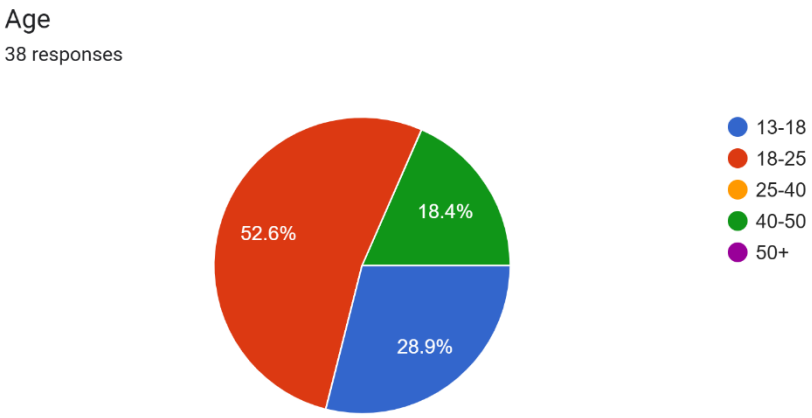
An audio survey was conducted to assess how users perceive the soundscape of Sunder Nursery.

Audio recordings from different spots within the park were compiled and shared through an online questionnaire. Participants were asked to rate the pleasantness of each clip.

The survey aimed to identify which sounds enhance or detract from the user experience, providing insights into the role of sound in shaping public space perception.

Figure 5.15: Questionnaire (Source: Author, Aid: Google Forms)

5.4.1 SURVEY RESULTS



Age is considered to explore how different age groups perceive soundscapes, as auditory preferences and sensitivities vary with age.

Figure 5.16: Age Distribution of Survey Participants (Source: Author, Aid: Google Forms)

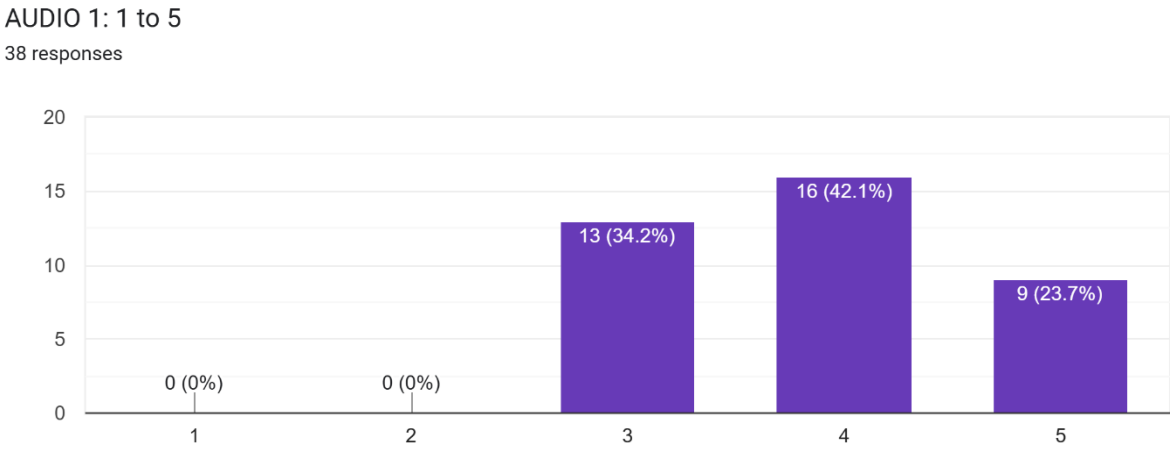


Figure 5.17: Survey Ratings for Audio 1 (Source: Author, Aid: Google Forms)

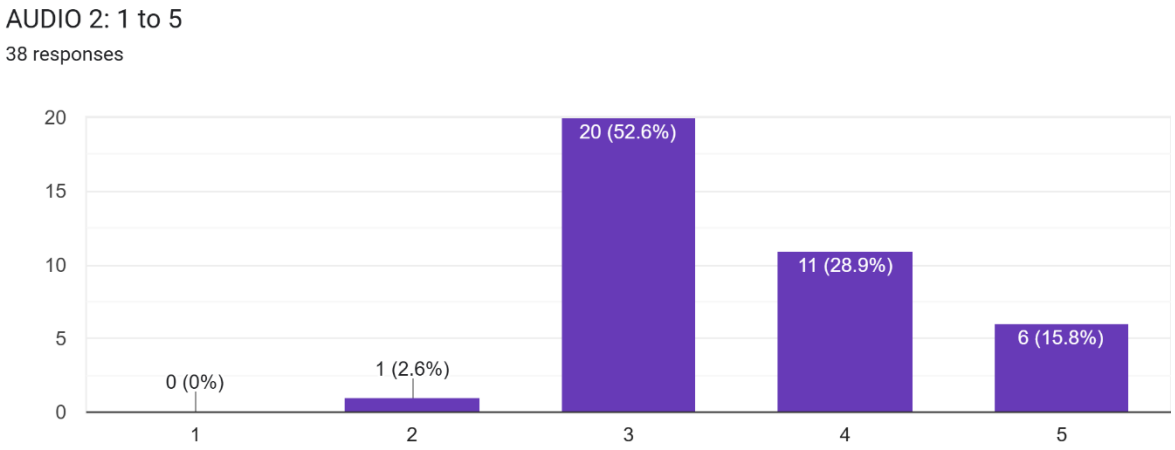


Figure 5.18: Survey Ratings for Audio 2 (Source: Author, Aid: Google Forms)

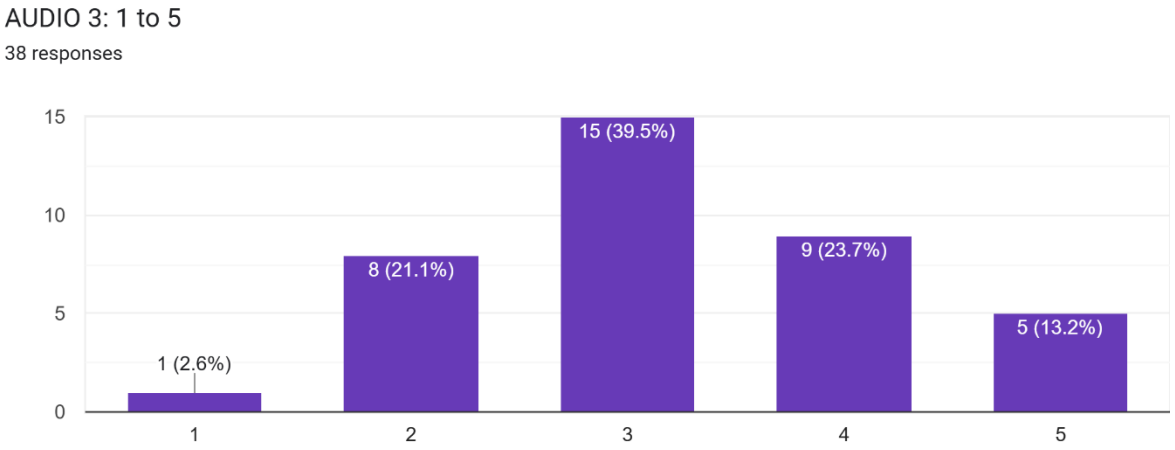


Figure 5.19: Survey Ratings for Audio 3
(Source: Author, Aid: Google Forms)

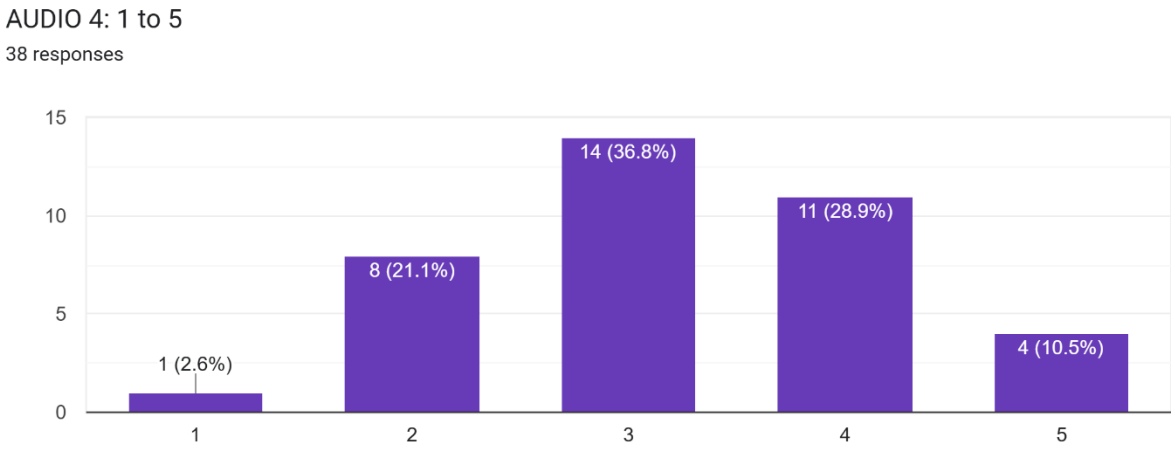


Figure 5.20: Survey Ratings for Audio 4
(Source: Author, Aid: Google Forms)

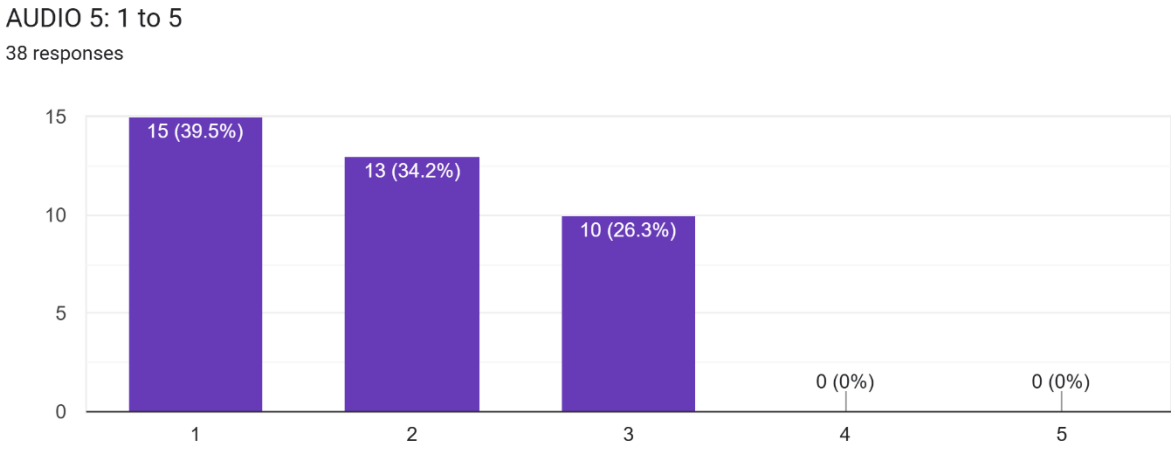


Figure 5.21: Survey Ratings for Audio 5

(Source: Author, Aid: Google Forms)

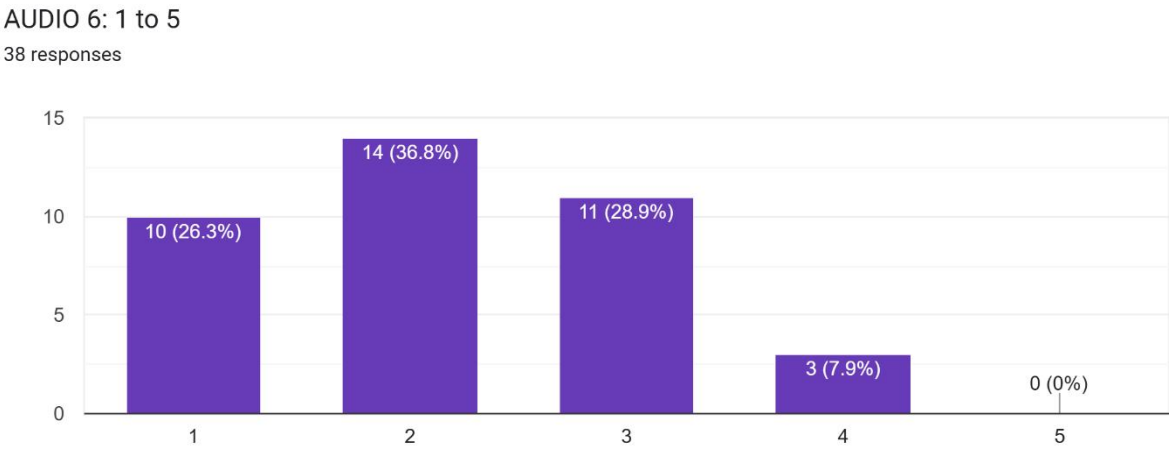


Figure 5.22: Survey Ratings for Audio 6
(Source: Author, Aid: Google Forms)

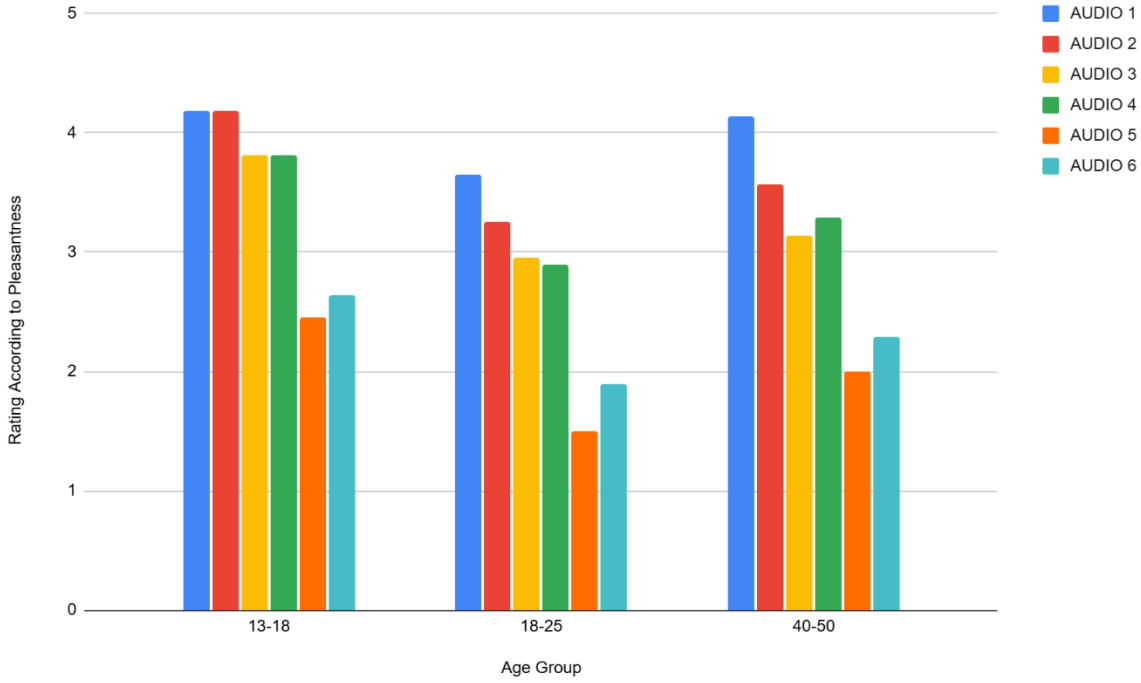


Figure 5.23: Comparison of Survey Ratings for All Audios Across Different Age Groups
(Source: Author, Aid: Google Forms)

This graph represents how different age groups rated the pleasantness of six soundscapes recorded at various locations in Sunder Nursery. Ratings range from 1 (least pleasant) to 5 (most pleasant).

Audio	Summary of Sounds	Ratings (by Age Group)	Interpretation
AUDIO 1	Gentle birdsong, rustling leaves, ambient wind, light human speech, faint bike/train	13–18: ~4.1; 18–25: ~3.7; 40–50: ~4.2	Universally pleasant due to natural biophonies and geophonies; minimal intrusive anthropophony. Ideal calm ambience.
AUDIO 2	Constant wind/water, birdsong, dominant human voice	13–18: ~4.2; 18–25: ~3.3; 40–50: ~3.6	Still liked, but less so by young adults due to dominant speech. Older groups may find it lively but not disruptive.
AUDIO 3	Flowing water, leaves, birds, and dominant human voices	13–18: ~4.2; 18–25: ~3.0; 40–50: ~3.2	The water element makes it pleasant, but speech prominence slightly reduces its restorative quality for some.
AUDIO 4	Irregular water flow, strong peacock call, birdsong, distant train	13–18: ~3.8; 18–25: ~3.0; 40–50: ~3.2	The peacock's call acts as a unique soundtrack. It is engaging for youth, but its irregularity may make it less relaxing for some.
AUDIO 5	Wind, birds, loud children, construction, and trains	13–18: ~2.6; 18–25: ~1.8; 40–50: ~2.0	Noisy and busy; perceived as chaotic. Construction and children’s play dominate, reducing pleasantness.
AUDIO 6	Faint water, birds, human voices, background music, cooler/fan	13–18: ~2.8; 18–25: ~2.0; 40–50: ~2.4	Cultural and indoor ambience (music/fan noise) were rated low overall, possibly due to artificiality or an enclosed feel.

Table 5.1: Interpretation According to the Survey (Source: Author)

5.4.2 KEY TAKEAWAYS

1. Natural elements (AUDIO 1 & 2) with biophonies and geophonies are rated most pleasant across age groups. These should be core to any restorative or inclusive landscape sound design.
2. Overt anthropophones (human speech, construction, fans) as in AUDIO 5 & 6, lower perceived pleasantness—highlighting the importance of acoustic masking and spatial separation.
3. Youth (13–18) are more open to rich and varied soundscapes (e.g., peacock call, water, children’s voices), while young adults (18–25) are the most selective, preferring quieter, more controlled soundscapes.
4. Older adults (40–50) strongly prefer natural yet familiar environments, moderately tolerating some human presence if it is not overwhelming.

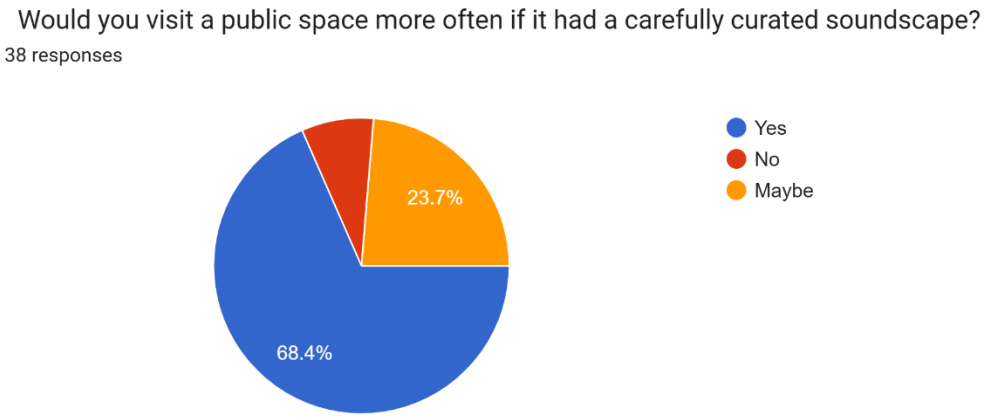


Figure 5.24: Willingness to Visit Public Spaces with Curated Soundscapes (Source: Author, Aid: Google Forms)

A significant majority (68.4%) of respondents indicated they would be more likely to visit a public space if it featured a carefully curated soundscape. This suggests that sound design has the potential to influence public space usage positively and should be considered a valuable tool in urban and architectural planning. Only a small percentage (7.9%) responded negatively, while 23.7% were open to the idea, indicating general receptiveness.

5.4.3 LIMITATIONS

While the survey offered valuable insights into how different age groups perceive soundscapes, several limitations must be acknowledged:

1. Small Sample Size: With only 38 respondents, the findings are indicative but not broadly generalisable.
2. Subjectivity: Pleasantness Ratings are highly personal and can be influenced by mood or context.
3. Playback Variability: The Online format meant the audio was played on different devices, affecting consistency in perception.
4. Lack of Spatial Context: Sounds were evaluated outside their original environments, which may have altered their impact.

5.5 CELEBRATORY SOUND PERCEPTION

Celebratory sound perception refers to how people experience and interpret sounds in a space that evokes feelings of joy, festivity, cultural richness, or community gathering.

It is not just about what is heard, but *how* those sounds are emotionally and culturally perceived, often as signs of life, connection, and shared experience. Sunder Nursery, nestled in the heart of Delhi, is more than just a heritage park—it is a living, breathing cultural landscape where history, nature, and human presence meet in a harmonious symphony. Visitors do not just see its beauty; they hear it. From the moment one steps into the nursery, the atmosphere shifts—faint water fountains and soft breezes blend effortlessly with bursts of children's laughter, footsteps on gravel, and conversations carried by the wind. These sounds are not just background noise; they form a celebratory pulse of community and life.

In recent years, Sunder Nursery has evolved into a leisure, learning, and celebration space. The soundscape, from the faint South Indian classical music to the distant peacock's call, reflects the place's multi-layered identity and the inclusiveness and diversity it fosters.

Frequent visitors are familiar with the creaking swings, the peacock's distant call, and the coolers' low hum. These are acoustic symbols that anchor memories. They function like aural landmarks—sound marks—connecting people emotionally to the space and evoking nostalgia for their past experiences at Sunder Nursery.

As a site of heritage and renewal, Sunder Nursery's soundscape offers sensory delight and cultural continuity. The blend of natural and human-made sounds invites reflection and celebration, reinforcing the idea that this space is not just preserved history, but lived experience.

5.6 FINAL CONSIDERATIONS AND DESIGN STRATEGIES

5.6.1 Objectives

- Minimise anthropophonic disturbances, particularly road traffic noise from surrounding urban infrastructure.
- Enhance and foreground natural soundmarks, such as the flowing of water in channels and fountains, birdsong, and insect activity.
- Preserving the site's acoustic ecology is not just a goal but a commitment to supporting the well-being and deeper connection to nature of all visitors to Sunder Nursery.

5.6.2 Desired (Wanted) Sounds

- Natural atmospheric sounds: wind rustling through leaves, rainfall on vegetation, and seasonal shifts in ambient tone.
- Water features: The gentle, continuous water flow from fountains, irrigation channels, and rain-fed catchments within the site acts as a soothing soundmark.
- Faunal presence: The calls and movements of birds, insects, and small animals that inhabit the gardens, particularly in less trafficked areas such as the Arboretum or around the lake.

These elements contribute to what Schafer calls a "hi-fi" soundscape, where the signal-to-noise ratio favours meaningful, subtle sounds over mechanical noise.

5.6.3 Unwanted Sounds (Disturbing Anthropophony)

- Vehicular traffic: Particularly from nearby Mathura Road and other access points.
- Agricultural machinery: Occasionally heard from adjacent heritage zones or during maintenance work.
- Loud human voices: From large tour groups or gatherings.
- Cyclists and mechanical disruptions, including bells and tires over gravel paths.

These elements introduce "lo-fi" soundscape characteristics, masking subtle natural sounds and diminishing restorative potential.

5.6.4 Strategies for Preservation and Enhancement

1. Habitat Protection Zones
    - Limit access to ecologically sensitive wooded areas with designated low-impact trails, preserving the natural habitat and its inherent soundscape.
    - Use acoustic zoning to separate active zones (near entrances or event lawns) from passive zones (arboretum, lakefront, mausoleum surrounds).
2. Sound Path Design
    - Introduce "soundwalk trails" that guide visitors through the site's quietest and most aurally rich parts.
    - Incorporate interpretive signage to encourage mindful listening and acoustic awareness.
3. Vegetative Buffering
    - Reinforce existing tree belts and hedges along peripheries to function as natural sound barriers—a proven passive method of mitigating traffic noise.
    - Plant dense shrubbery and vertical green walls near leading road edges, specifically near the Batashewala Complex and entry points.
4. Quiet Zones / Silent Spots
    - Design small acoustic refuges, such as shaded pergolas or tucked-away benches, intentionally distanced from anthropophonic sources.
    - Signage can encourage visitors to maintain silence, enhancing human experience and wildlife comfort.
5. Bicycle Flow Management
    - Create exclusive bicycle paths that do not intersect with walking trails.
    - Use soft ground materials or rubber-paved paths to reduce wheel and gear noise.

5.6.5 Website Prototype: Mood-Based Natural Sound Access

As an extension of the soundscape design approach, a website prototype was developed to explore how users can consciously access curated natural sounds based on their mood and emotional needs. The prototype envisions a digital interface where visitors can select soundscapes—such as flowing water, birdsong, or rustling leaves—tailored to feelings like needing focus, calm, energy, or relaxation.

This concept supports the idea that soundscaping does not end at the physical site but can extend into personalised digital experiences that users carry. It highlights the potential of blending environmental psychology, acoustic design, and technology to promote well-being in both physical and virtual spaces.

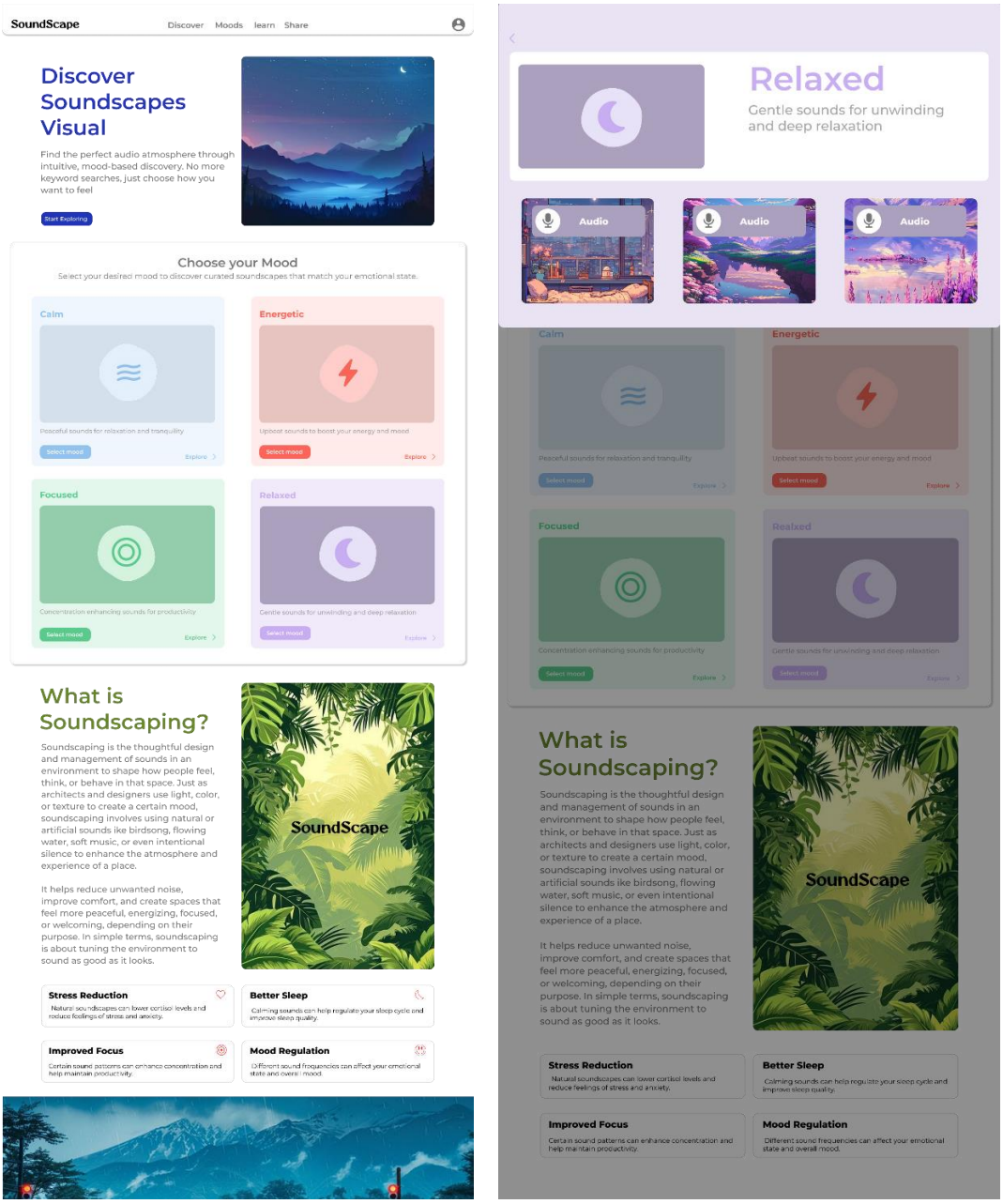


Figure 5.25: Website Prototype Interface with QR for link and video (Source: Author, Aid: Figma)

CHAPTER 6: CONCLUSION

This dissertation explored the potential of soundscaping as a meaningful, multisensory design strategy in urban environments. Through theoretical basis, case studies, site analysis at Sunder Nursery, and surveys, the study revealed that sound is not just background ambience but a powerful spatial agent that influences perception, mood, memory, and well-being.

Natural sounds such as birdsong, wind, and flowing water were consistently rated as the most pleasant across all age groups. In contrast, anthropophonic sounds like traffic, construction, or loud voices were perceived as disruptive. Age emerged as a key factor influencing sound perception, with adolescents being more receptive to varied soundscapes and older adults showing a stronger preference for calm, nature-based acoustics.

To translate these insights into practical design strategies, the study proposed context-specific interventions, including acoustic zoning, vegetative buffering, sound walk trails, and quiet refuge spots. These strategies aim to preserve the acoustic identity of spaces like Sunder Nursery while improving user comfort and inclusivity.

Additionally, a website prototype was developed as a digital extension of this research. It allows users to access curated natural sounds based on different emotional states, demonstrating how soundscaping can support public space design and individual well-being in digital contexts.

However, the dissertation is not without limitations. The survey sample size was modest (38 respondents), limiting statistical generalisation. The scope was site-specific, focusing only on Sunder Nursery, and does not account for variability across seasons or times of day. The acoustic analysis was qualitative, based on perceived pleasantness, without deep technical calibration. Lastly, the website prototype remains conceptual and was not field-tested for broader application.

Despite these constraints, the study successfully opens up a design conversation that extends beyond sightlines to consider the emotional and spatial impact of what we hear. It reinforces the idea that soundscaping is not an add-on but a fundamental design layer, capable of transforming public spaces into emotionally resonant and inclusive environments.

In a time of escalating urban noise and typical sensory disconnection, this research advocates for a shift from passive hearing to intentional listening and from sound as pollution to sound as a design possibility.

CHAPTER 7: EPILOGUE

During this research, I realised how many sounds—that are part of our everyday lives—we take for granted. We are not used to listening to them or noticing any change in the soundscape. However, at the base of every landscape transformation process is a multisensorial experience. It is essential to have a strong awareness of the dynamics and relationship between humans, nature, and everything else in the environment.

When a landscape surrounds us, it is fundamental to recognise it and value it at its best. This is possible only if we turn on all our senses to listen, taste, smell, touch, and see what the landscape can offer. We should put ourselves in an active state towards the surrounding environment.

Sounds are only one of the various elements the landscape is composed of, and as such, they are part of a place's everyday development. We must understand the familiar sounds to give a place a specific identity and a sense.

As highlighted in the previous pages more than once, a universally valid and sure methodology does not exist when analysing a soundscape. This is true because a unique method would cancel the dynamism and mutability of sound itself. Every place stands on its own: it has an identity to be respected and preserved.

However, as proved in this research, what we can do as architects is to apply a method of analysis that allows us to deeply understand the site project, in order to find its sound identity. It is meant to investigate the properties, the features and the peculiarities of sounds, considering the different ways of perception and the subjectivity of the listeners. Through this procedure, we will be able to understand the site's problems and consequently find solutions to enhance the soundscape. This mode of action is not so different from the jobs that architects already do, but - until today - few of them deal with the sound component of the landscape. We have always taken it for granted and never really understood its importance.

Let us try to consider it more often now. We will definitely “listen to” the effects of this new habit soon.

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